

CLAIMS

1. A directional coupler comprising at least one dielectric layer and two line electrodes that are formed on the at least one dielectric layer,

the two line electrodes comprising an inner line electrode and an outer line electrode that surrounds the inner line electrode as viewed from the top,

wherein corresponding currents are transmitted in the same direction through sections of the inner line electrode and the outer line electrode that are adjacent and parallel to each other.

2. A directional coupler comprising at least one dielectric layer and two line electrodes that are formed on the at least one dielectric layer,

the two line electrodes comprising a spiral-shaped or helical-shaped inner line electrode and a spiral-shaped or helical-shaped outer line electrode that surrounds the inner line electrode as viewed from the top.

3. The directional coupler according to Claim 1 or 2, wherein the length of each of the inner line electrode and the outer line electrode is less than a quarter of a wavelength.

4. The directional coupler according to Claim 1, 2, or 3, wherein the width of the inner line electrode is smaller than the width of the outer line electrode.

5. The directional coupler according to Claim 1, 2, 3, or 4, wherein the number of turns of the inner line electrode is larger than the number of turns of the outer line electrode.

6. The directional coupler according to Claim 1, 2, 3, 4, or 5, wherein the inner line electrode and the outer line electrode are formed on the same plane.

7. The directional coupler according to Claim 1, 2, 3, 4, or 5, wherein the inner line electrode and the outer line electrode are formed on different planes.

8. The directional coupler according to Claim 1, 2, 3, 4, or 5, wherein at least one of the inner line electrode and the outer line electrode is divided into line electrode components that are formed on a plurality of planes, and the divided line electrode components are connected in series with each other through a via hole.

9. The directional coupler according to Claim 1, 2, 3, 4, 5, 6, 7, or 8, further comprising a ground electrode that is formed on the at least one dielectric layer, wherein capacitances are formed between the ground electrode and individual ends of the inner line electrode and the outer line electrode.